MULTI'PULSE DC
Lubrication pump for industrial mahine and mobile devices

User operation and Maintenance manual
Warranty

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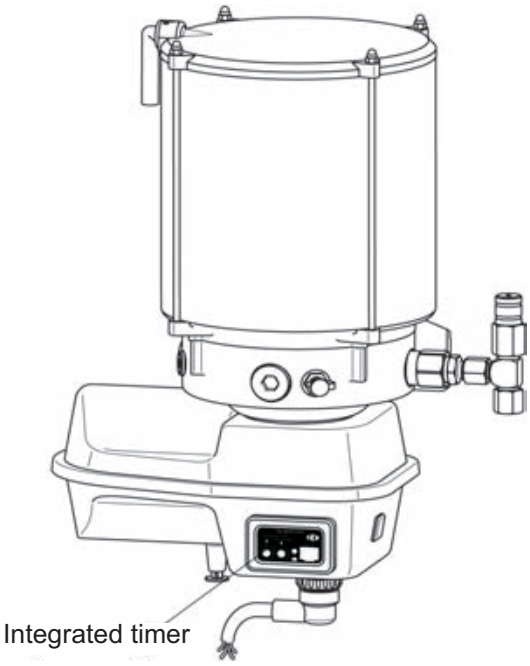
2. INTRODUCTION

This user and maintenance manual refers to the MULTI'PULSE DC lubrication system.
This manual should be conserved in such a way that it remains undamaged over time and is readily available to personnel needing to consult it.
The manufacturer reserves the right to update the product and/or the user and maintenance manual without the obligation to revise previous versions.Further copies of this manual, updates or clarifications can be obtained by directly contacting Experts & Tools at NTN-SNR Roulements, or to consult our web site at www.ntn-snr.com.
The use of the equipment referred to in this manual must be entrusted to qualified personnel with a basic knowledge of mechanics, hydraulics and electrical systems.
It is the responsibility of the installer to use tubing suitable for the system; the use of inadequate tubing can cause problems with the pump, injury to persons and create pollution.
Loosening of connections can cause serious safety problems; carry out a check before and after installation and, if necessary retighten them.
Never exceed the maximum working pressure values permitted for the panel and the components connected to it.
Before any maintenance or cleaning operation disconnect the power supply, close off the airsupply and discharge the pressure from inside the equipment and the tubing connected to it.
Do not subject the panel, the connections, the tubing or parts under pressure to violent impacts; damaged tubing or connections are dangerous and should be immediately replaced.
After long periods of inactivity check air tightness of all parts subjected to pressure.
Personnel must use personal protection equipment, clothing and tools adequate for the location and the use of the panel both during its operation and during maintenance operations.
The panel, and any accessories mounted on it, should be carefully checked immediately on receipt and in the event of any discrepancy or complaint the NTN-SNR Roulements Sales department should be contacted without delay.
NTN-SNR Roulements declines to accept any responsibility for injuries to persons or damage to property in the event of the non-observance of the information presented in this manual.
Any modification to component parts of the system or the different destination of use of this system or its parts without prior written authorization from NTN-SNR Roulements will absolve the latter from any responsibility for injury to persons and/or damage to property and will release them from all obligations arising from the guarantee.

3. GENERAL DESCRIPTION

The NTN-SNR centrral lubrication pump model MULTI'PULSE DC is electrically actuated and can have up to a maximum of 3 independently operating lubricant outlets. One pumping element is mounted on one outlet as standard outlet.
These pumps enable the delivery of commercial lubricants up to NLGI-class 2 at a working pressure of maximum 280 bar (adjusting of pressure relief valve).
The MULTI'PULSE DC series pumps differ in control type. MULTI'PULSE DC can be controlled externally e.g. via PLC or their own electronic timer.

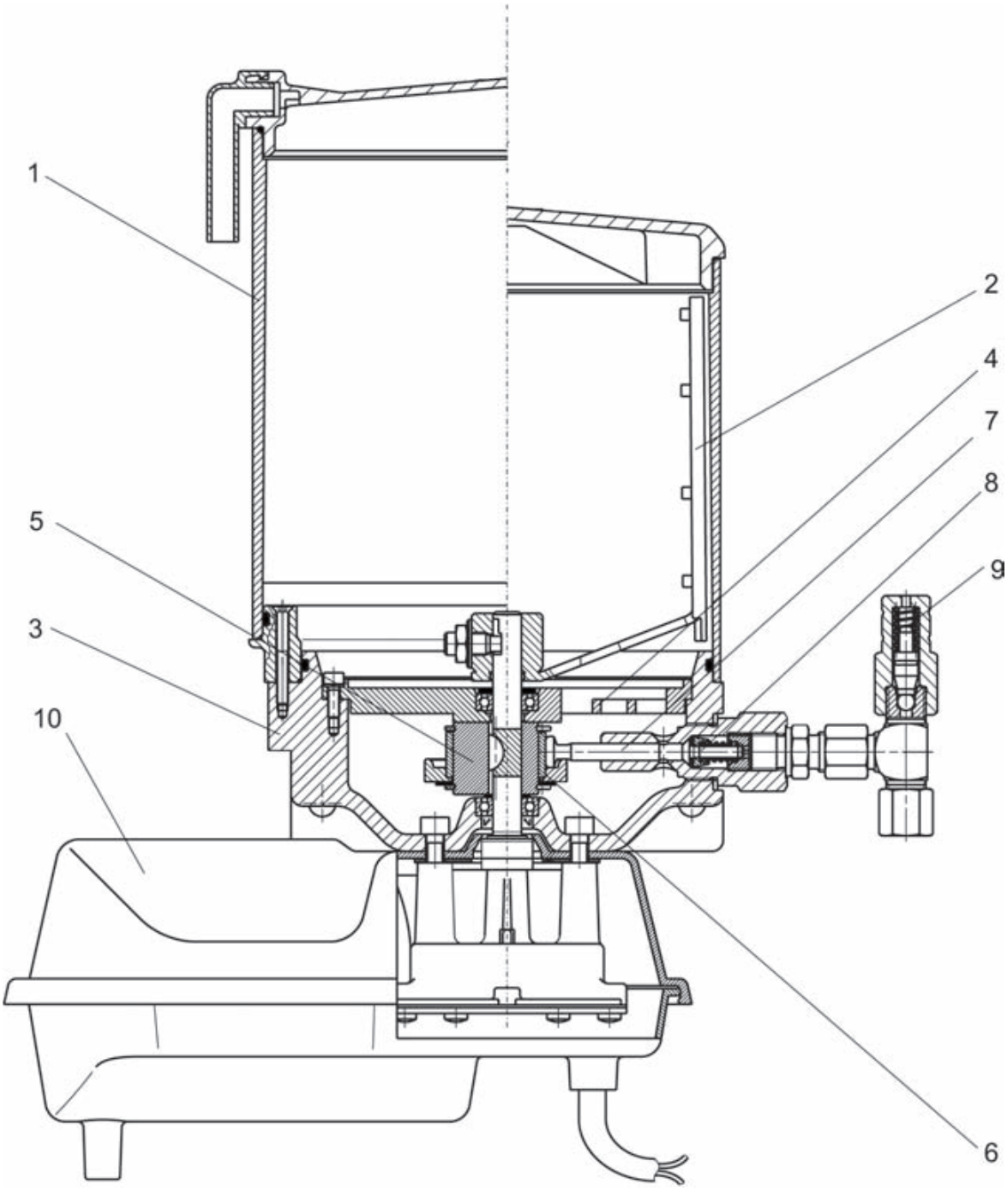
Electric pump MULTI'PULSE DC with 4kg reservoir and integrated electronic timer :



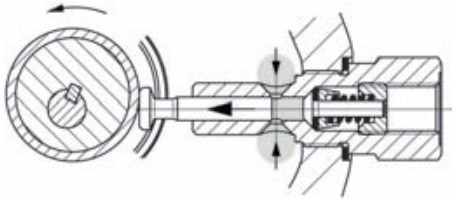
Technical data :

Motor	
Operating voltage	12 V DC / 24 V DC
Revolutions	15 T/min
Current consumption	
Idling at +20°C (12 VDC / 24 VDC)	0,8 A / 0,4 A
Full load at +20°C (12 VDC / 24 VDC)	2,2 A / 1,1 A
Fuse (12 VDC / 24 VDC)	5 A / 3 A
Pump	
Max. operating pressure (Adjusting of pressure relief valve)	280 bar
Permissible operating temperature	-35°C to +80°C
Reservoir	
Transparent reservoir capacity	4 kg
Stirrer rotation direction	counterclockwise
Mounting position	Vertical
Pumping element flow rate	
LUBSO PUMPING ELEMENT DC	120 mm^3 / stroke
LUBSO PUMPING ELEMENT ADJUSTABLE DC	40 à 120 mm^3 / stroke
Protection type	IP5K9K as per DIN 40050
Lubricant	Grease up to NLGI-Kl./2 (excluding solid lubricants) Mineral oils above 46 mm^2/s(sCt)

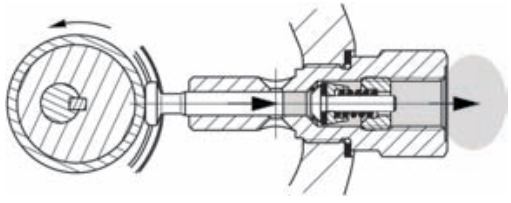
A DC motor (10) continually operates the eccentric cam (5) and pressure ring (6). This eccentricity effects the suction and pressure strokes of the delivery piston (7), whereby the integrated non-return valve (8) prevents the delivery media from being sucked back out of the main line.
The stirrer (2) pushes the lubricant out the supply container (1) through a screen (4), which reduces any air bubbles, to the suction area in the pump housing.(3). A scraper on the stirrer (2) enables a visual check of the lubricant volume still present in the transparent supply container (1).
The pressure relief valve (9) is pre-set to 280 bar.



Pump element is drawing:

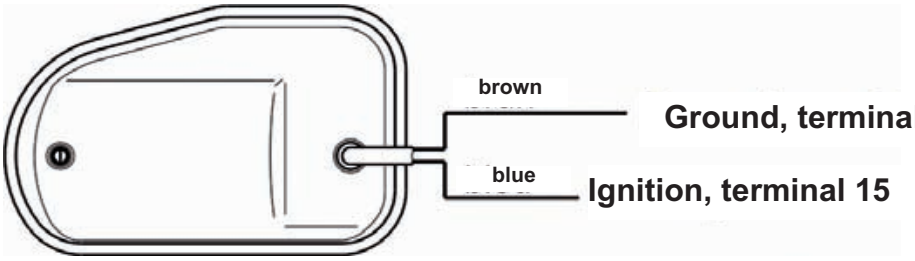


¨Pump element is delivering:



4. RESERVOIR MODEL AND INSTALLATION

Terminal diagram:

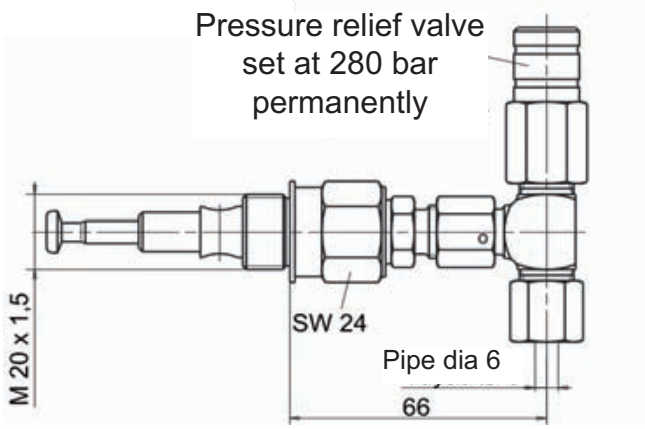


WARNING : Stirrer rotation direction indicated by the arrow on the tank

5. PUMPING ELEMENTS

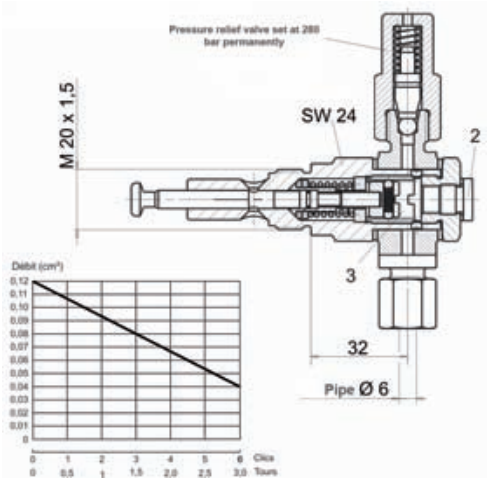
LUBSO PUMPING ELEMENT DC
Technical data:

Max. delivery rate	0,12 cm^3 at full stroke



LUBSO PUMPING ELEMENT ADJUSTABLE DC
Technical data:

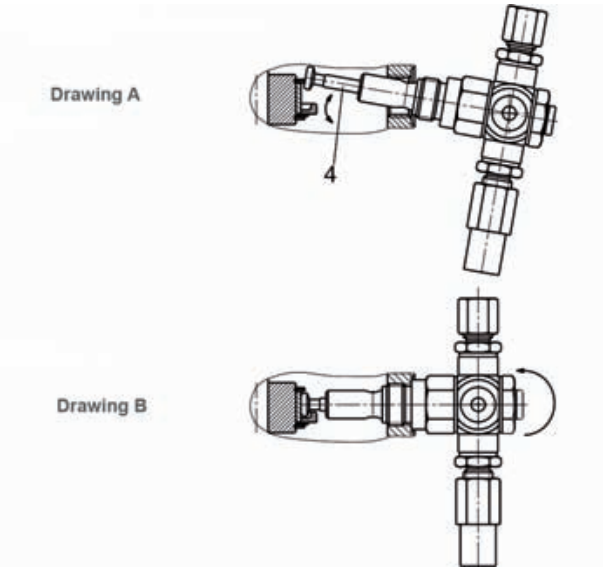
Delivery rate	0,04 to 0,12 cm^3/stroke
Piston diameter	6 mm
Maximum delivery rate	0,12 cm^3 per stroke
Reduction	0,013 cm^3 per notch
Regulation of delivery rate	6 notches, 1 each 1/2 revolution
Lubricant	greases from NLGI-KI00/000 to NLGI-KI.2
Piston return	forced



Adjusting the delivery rate:
- Remove plug screw (2) with Allen key (SW 5)
- Turn adjusting screw (3) with a screwdriver
- Turn clockwise to reduce delivery rate
- Turn counterclockwise to increase delivery rate
- Maximum stroke of adjusting screw is 2.4mm = 6 notches
- 1 turn of adjusting screw is 0.8mm = 2 notches
- Tighten plug screw (2) incl. sealing ring

Installalation of pump elements in electric pump MULTI'PULSE DC:
- Only install/remove when pump is off
- Install pump unit with piston partially extended (see diagram A) insert at angle in top of housing bore (see diagram A)
- When the piston head rests on pressure ring - move pump element into vertical position (see diagram B)
- Piston head must run in guide ring groove
- Tighten pump element
- For removal, reverse above sequence
- When removing the pump element, ensure that the piston (4) is not left behind in the pump housing

Installation

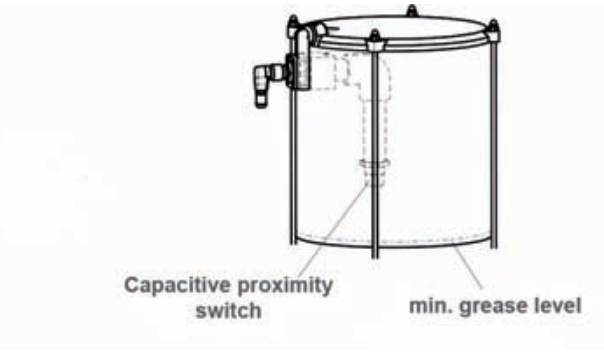


6. ACCESSORIES

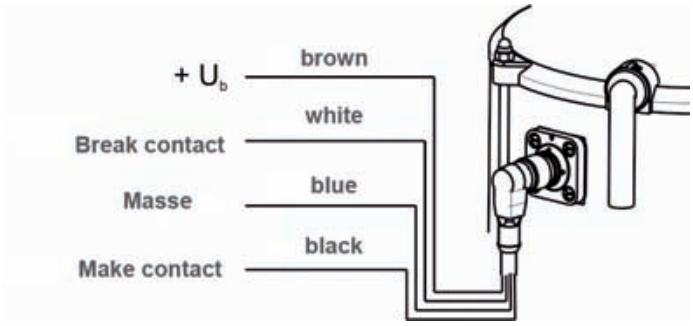
Grease level controller:

The electric pump MULTI'PULSE DC is equipped with an electronic grease level controller to control the minimum grease level. A capacitive proximity switch is built into the pump reservoir for this purpose. This emits a signal as long as there is sufficient grease in the reservoir (standard). If the grease level sinks below a certain level, the proximity switch switches off the signal.

Operating voltage	10 to 35 V DC
Connecting method	PNP-turnkey
Maximum current load	250 mA
Protection type : switch	IP 67
Ambient temperature range	-25°C to +70°C
Connection	4-pole M12x1, plugable



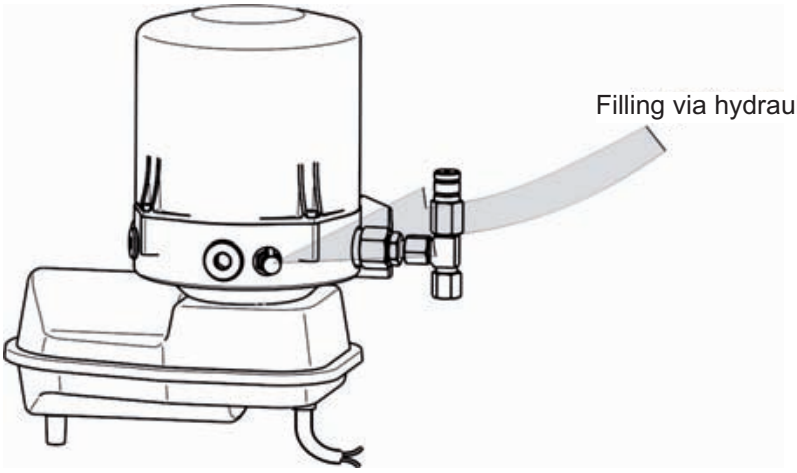
Connection diagramt:



If the black connection wire is connected to +U_b, a signal is received as long as there is sufficient grease in the supply reservoir.
If the white connection wire is connected to to +U_b, a signal is received when the grease level sinks below a minimum in the suppply reservoir.

7. FILLING THE PUMP

Standard filling via hydraulic greaser with manual or pneumatic grease gun:



8. MAINTENANCE PROCEDURE

<u>WARNING:</u> Before carrying out any maintenance operation, ensure that power and hydraulic system are disconnected.

The MULTI'PULSE DC pump does not require any special tool for operation and maintenance. When working with the MULTI'PULSE DC pump it is nonetheless recommended that personal health and safety equipment is used as it is normal for any operation in an industrial or similar workplace to best safeguard the user from harm.
The MULTI'PULSE DC pump has been designed and built as to require minimal maintenance and operate in diverse and challenging operating environment. It is recommend that the unit is inspected and kept clean to ensure long life and trouble free operation. It is important to check all tubing on the system to ensure that it is always tight and leak free.

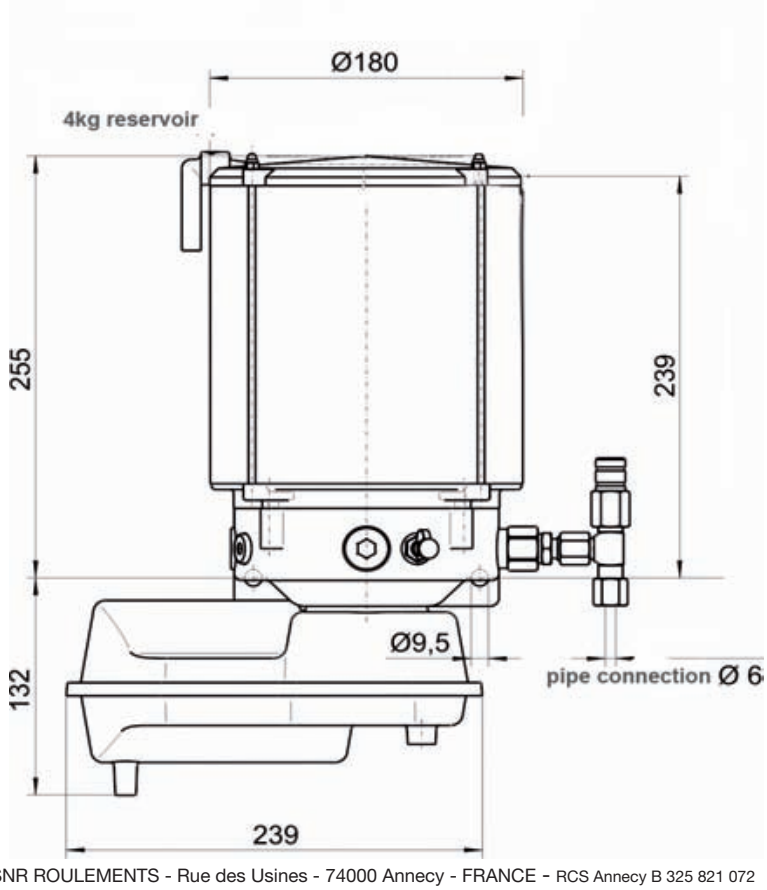
8.1 Operational Maintenance
The following operations should be performed on the pump:

Item	Frequency	Operation
Integrity of tubing and system	After initial 500 hours. Every1500 hours.	Check fittings and tubing secured. Verify components are correctly fixed to machine.
Reservoir level	As needed	Top up level with clean lubricant.

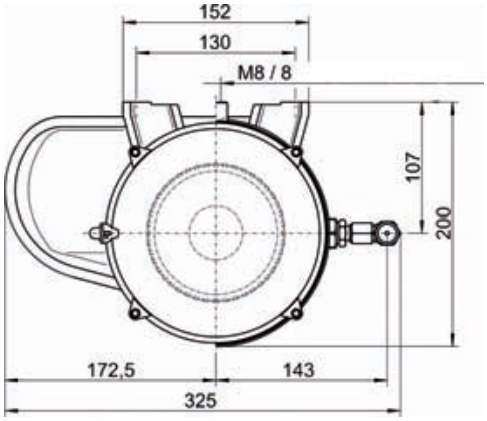
9. DISPOSAL

During maintenance or disposal of the machine care should be taken to properly dispose of environmentally sensitive items such as oils or other lubricants. Refer to local regulations in force in your area. When disposing of this unit,it is important to ensure that the identification label and all the other relative documents are also destroyed.

10. DIMENSIONS



(millimeter)



11. HANDLING AND TRANSPORTATION

Prior to shipping, the equipment is carefully packed in cardboard package. During transportation and storage, always maintain the pump the right way up as indicated on the box. On receipt check that package has not been damaged. Then, store the machine in a dry location.

12. PRECAUTIONS FOR USE

<u>WARNING:</u> It is necessary to carefully read the instructions and the risks involved in the use of lubrication machines. The operator must know the machine functioning through the User and Maintenance Manual.

It is necessary to carefully read the warnings and the risks involved in using the lubrication panel. The operator must understand the functioning of the unit by studying the user's manual.

Electric currents
No intervention must be attempted on the equipment without first having disconnected the electrical power supply and ensuring that it cannot be reconnected during the intervention.
All installed equipment, electrical, electronic, tank and base structure, must be connected to the ground line utilizing the terminals fitted to each component.

Flammability
The oil employed in the lubrication circuit is not normally flammable. It is nonetheless indispensable to take every precaution against the oil coming into contact with very hot parts or open flames.

Pressure
Prior to any intervention on the equipment ensure that pressure is released from all branches of the lubrication circuit. Failure to do this could result in oil being discharged under pressure where connections or components are disassembled

Noise
The MULTI'PULSE AC lubrication panel does not emit excessive noise, remaining below 70dB(A).
WARNING: before carrying out the replacement of the mini-pumps, empty the tank of lubricant.
14.1 Lubricants

<u>NOTE:</u> The pump has been designed to operate with max NLGI 2 grease or min 46cst Oil (oil version). Always use lubricants compatible with NBR (Buna) rubber seals.
Any residual lubricant found on new units is residual NLGI 2 test grease used during the assembly of the pump.

Grease	
NLGI	**ASTM**
000	445 - 475
00	400 - 430
0	355 - 385
1	310 - 340
2	265 - 295
For further technical information and on safety information consult the lubricant MSDS Safety data sheet or equivalent document supplied by the lubricant manufactuer.	

13. CONTRAINDICATIONS

The verification of conformity with the essential safety requirements and regulations of the Machine Directive is effected by means of the compilation of a check list which has been pre-prepared and is contained in the technical file.
The lists which are utilised are of three types:
• list of dangers (appendix A, EN 1050).
• application of essential safety requirements (Machine Dir. - att. 1, part 1).
• electrical safety requirements (EN 60204).

The following is a list of dangers which have not been fully eliminated but which are considered acceptable:
• During installation there may be low pressure oil coming from the pump. Always use appropriate protective clothing, gloves and take all necessary safety precautions.
• Contact with lubricant during maintenance or filling of the reservoir. As per previous point, correct precautions must be taken to protect from contact with lubricant.
• Moving Parts and crush danger : All moving parts are enclosed within the pump unit. Do not open the pump unit. Appropriate danger labels are located on the pump.
• Electric shock : All electrical connections must be carried out by a qualified electrician who has studied the connection to remove electrical danger.
• Abnormal operation posture : The pump should be installed in a suitable position with ample clearance as indicated in this manual to avoid abnormal posture for the operator.
• Unsuitable Lubricant. : Lubricant characterstics are indicated on the pump and in this user manual. In any case contact a NTN-SNR Support engineer.

Fluids explicitly not allowed	
Fluids	**Danger**
Lubricants with abrasive additives	High wear rate of contacted parts
Lubricants with silicone based additives	Seizure of the pump
Petrol – solvents – inflammable liquids	Fire – explosion – damage to seals
Corrosive products	Corrosion of the pump– injury to persons
Water	Oxidation of the pump
Food substances	Contamination of the substances themselves

14. WARRANTY

All products manufactured and marketed by NTN-SNR Roulements are warranted to be free of defects in material or workmanship for a period of at least 12 months from date of delivery.

Extended warranty coverage applies as follows if complete system installation by NTN-SNR Roulements: 12 Months.

If a fault occurs, notify NTN-SNR giving:
- a complete description of the alleged malfunction
- the part number(s)
- date of delivery
- date of installation
- operating conditions of subject product(s)

NTN - SNR Roulements reserves to right to charge an administration fee if the product(s) returned are found to be not defective.

This limited warranty does not cover any products, damages or injuries resulting from misuse, neglect, normal expected wear, chemically caused corrosion, improper installation or operation contrary to factory recommendation. Nor does it cover equipment that has been modified, tampered with or altered without authorization.

Consumables and perishable products are excluded from this or any other warranty.

No other extended liabilities are stated or implied and this warranty in no event covers incidental or consequential damages, injuries or costs resulting from any such defective product(s).

The use of NTN-SNR product(s) implies the acceptance of our warranty conditions. Modifications to our standard warranty must be in made in writing and approved by NTN-SNR Bearings.

Web site : www.NTN-SNR.com - Email: expertsandtools@ntn-snr.com

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